January 31, 1952

Dr. Werner K. Maas
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Dear Werner:

I think that Esther and I had already written to you some time since about our negative experiences with the infertile pant. mutants you provided. We worked primarily with your K1-QT-h. I take it that the sequence of origin of this strain was K-12 — K1T — K1 — K1-QT — K1-QT-h. We were and continue to be unable to cross this with any of our stocks, haploid or diploid. Wechave not examined any of the TS stocks; perhaps I should try to make a TS/+ diploid for you even without suitable linkage information.

Esther's infertile combinations haveturned into a rather remarkable story which we have, however, been unable to relate to your observations on pant. Her stock, W-1321 (ultimately from 58-161) may be designated F- (in contrast to type, e.g., 58-161, F+). F- is a self-incompatibility factor; we have also picked it up in some other lines. F- x F- is completely infertile. F+ x F+, and especially F+ x F- are, of course, fertile. To make a long story short, F+ is transmitted to F- cells with very high efficiency when the two kinds of cells are mixed in a complete medium. For example, $10^8$ cells of 1321 + $10^8$ 58-161 incubated for one hour, then plated out, the 1321 colonies reisolated by fermentation markers, gave about 10% W-1321 now F+. The acquired F+ is genetically stable as is the original. Filtrates and the BBB (Bernie's bacterial bundling board) gave no transmission so far. When 58-161 is grown with heavy aeration, the cells are a phenocopy of F-. A small proportion may be irreversibly F-. I suspect that under conditions of rapid growth, the F+ does not keep pace with the cells (like kappa in Paramecium a la Preer.) F+ is not lambda. Anyhow, your K1QTh is also F+, as shown by transmission to W-1321.

What I wanted to ask you about particularly was the surprise, turned up in the lastnamed experiment that K1QTh is lysogenic for a phage active on W-1177, and therefore not lambda. Since all of the other K1 and K1T stocks you sent me behave the same way, I would assume that the phage turned up between K-12 and the single K1T (ts) which I infer to be ancestral to all the cultures sent. The phage is difficult to see; I noticed it only on EMB Lac + sm on which the K1QTh was inhibited. I would appreciate it if you could either verify the point of origin, or send me <u>your</u> K-12 and K1T. Can you offer any suggestion as to the possible origin of the phage, except that it might be some sort of lambda mutant? Was K1T ever exposed to foreign bacteria? As I remember the W strain was not lysogenic, but I shall have to check that again.

Sincerely,